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ARTIFICIAL EYES HAVING A CHANGEABLE PUPIL AND MOVABLE IRIS PORTION ACTUATED BY MUSCLE TISSUE

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ABSTRACT OF THE DISCLOSURE

Artificial eye for use as replacement for a natural eye includes a body portion receivable in the natural eye socket, the body carrying a movable and detachable iris and pupil portion whose motion is obtained by the natural muscle acting through a suction cup thereon and connected to the body through a universal bearing on the body. A transparent cover over the iris and pupil portion may be fixed relative to the iris and pupil portion on the body.

The invention relates to artificial eyes constructed of plastic or improved materials, wherein the iris portion, or the iris and scleral portions combined, move in a manner similar to the movements of the natural eye. The invention differs from products of the known art by method of construction, function, and advantage to the user, with the principal distinction being that component parts of the artificial eye are not permanently connected into a solid instrument. The advantages achieved by deviating from the prior concept of single-unit, one-piece construction are a further distinguishing factor.

Existing deficiencies in the present art, such as restricted movement, uncontrolled eye secretions, unchangeable pupil size, sagging eyelids, and air pockets between the artificial eye and the eye socket, are objects for improvement in the invention.

The principal object of the invention is to produce an artificial eye which will closely resemble a natural eye in both appearance and movement, and which will provide comfort to the user by eliminating some of the irritating deficiencies in artificial eyes of the present art.

Novel features achieved by the invention are:

(1) The production of an artificial eye which permits additional movement within the eye socket of an individual, beyond the movement normally permitted in artificial eyes constructed of one integral body;

(2) The production of an artificial eye wherein the component parts are interchangeable with component parts of another artificial eye. The primary advantage to this feature is that the iris portion can be changed to permit the pupil size to match the pupil size of the natural eye. The natural pupil, of course, expands or decreases in size depending upon the lighting condition to which the user is exposed:

(3) The production of an artificial eye wherein the component parts are adjustable;

(4) The production of an artificial eye which controls eye secretions;

(5) The production of an artificial eye which is partially self-supporting within the eye socket, and by being so, eliminates the formation of air pockets between the artificial eye and the eye socket; and

(6) The production of an artificial eye which permits the eyelids to contribute additional movement to the iris and scleral portions of the artificial eye.

Other objects and advantages of the invention will become apparent from the following description taken in connection with the annexed drawings, and it will also become apparent that many changes in the details of construction, arrangement of parts, and method shown and described may be made without departing from the spirit of the invention. The invention should not be limited to the exact details of construction, arrangement of parts, and method shown and described, since the preferred form only will be given by way of illustration.

It is particularly pointed out that the description of improvements in the invention do not generally apply to artificial eyes which are permanently connected to the muscle tissues of the eye socket, except where said artificial eyes are constructed in a manner which will infringe upon the artificial eyes of the invention.

The invention comprises three distinct, but closely related artificial eyes, wherein the method of construction, design, and function are so intimately connected that incorporation herein is considered appropriate.

At this point, the three types of eyes are described as; an artificial eye where in the iris portion is a separate, moveable part, being moveable beyond that point normally permitted in artificial eyes of the present art; an artificial eye wherein the iris and scleral portions are separate parts also movable, outside the socket portion, beyond that point normally permitted in artificial eyes of the present art; and an artificial eye wherein the iris and scleral portions are separate parts also moveable, inside the socket portion, beyond that point normally permitted in artificial eyes of the present art.

The artificial eyes of the invention are not dependent upon the body of the artificial eye for movement, as are artificial eyes of the present art.

For the purpose of brevity and clarity, materials and molds used throughout the specification are explained prior to the detailed description.

Materials commonly used in the art, such as methyl methacrylate, methacrylic resins, acrylic resins, methyl acrylate, butyl acrylate, polystyrene, the like, or any known artificial resin capable of withstanding eye secretions and which will not excessively irritate the socket tissues, are acceptable for use herein. Methyl methacrylate is the preferred material in the invention. Color pigments are added, as required, prior to molding to produce the desired color in the finished product. Of course, improved materials, as developed, will be used to improve the artificial eyes.

Excluding the iris portion, the several parts of the invention are formed by placing the desired plastic, with or without color pigment added thereto, into a mold cavity of the desired shape and size, and by subjecting the mold to sufficient heat and pressure to cause the plastic to assume the shape of the mold cavity. When sufficiently hardened, the plastic is removed and buffed or polished to provide the desired smooth outer surfaces.

The molds used in forming the component parts are preferably constructed by skilled persons so that the desired shape and size will be produced without excessive grinding or sanding; however, the molds can be handmade of clay, plaster, or other similar materials.

A mold is required for each of the component parts, and the mold cavity must be meticulously designed to produce the desired characteristics in the final product.

The advantages provided in the artificial eyes of the invention, named at the onset of the specification, are further described to show the method of achieving the advantages.

Referring to FIGURES II and III of the annexed drawings wherein the iris portion of the artificial eyes of the invention are shown, the pupil is first shown in an expanded dimension, and secondly in a contracted dimension. By nature, the iris portion of a natural eye adjusts itself to the particular lighting conditions to which an individual is exposed. However, the iris portion of an artificial eye of the present art has a set pupil size, which is unchangeable regardless of the lighting condition to which the used is